



TMI-5010

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): H. OGASAWARA, et al

Serial No.: 10/673,162

Filed: September 30, 2003

For: STORAGE DEVICE SYSTEM AND STORAGE DEVICE  
SYSTEM ACTIVATING METHOD

**REQUEST FOR RECONSIDERATION**

**MS Petition**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

January 9, 2006

Sir:

**1. Petition**

Applicants hereby renew its Petition to make this application **Special** previously submitted on February 17, 2004, in accordance with 37 CFR §1.102(d) and MPEP 708.02, VIII. The February 17, 2004 Petition was denied by a Decision issued on November 8, 2005 in which the Petitions Examiner stated that the February 17, 2004 Petition failed to recite distinct features of the claimed subject matter. The present Request for Reconsideration of Petition incorporates by reference the February 17, 2004 Petition and provides additional details regarding the claims and how the claimed subject matter is patentable over the references. The present invention is a new application filed in the United States Patent and Trademark Office on September 30, 2003 and as such has not received any examination by the Examiner.

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**(A) This Petition is accompanied by the fee set forth in 37 CFR §1.17(h).**

The Commissioner is hereby authorized to charge any additional payment due, or to credit any overpayment, to Deposit Account No. 50-1417.

**(B) All claims are directed to a single invention.**

If the Office determines that all claims are not directed to a single invention, Applicant will make an election without traverse as a prerequisite to the grant of special status in conformity with established telephone restriction practice.

**(C) A pre-examination search has been conducted.**

The search was directed towards a storage system that is capable of being connected to a plurality of different types of networks, and a method of controlling activation of the storage system. The storage system of the present invention as recited in the claims includes, for example, a plurality of storage devices in which information is stored, a storage device control section that controls storage of information in the storage devices, and a connection unit connected to the storage device control section.

The storage system according to the present invention further includes a first communication control section having a first processor that is connected on a first network external to the storage system, that converts information of a first form, which is received over the first external network, into information of a second form, and that issues a request for access to the storage devices, and a second processor that accesses the storage devices via the connection

unit and storage device control section, in response to the access request issued from the first processor, and that controls activation of the first processor.

The search of the above features was conducted in the following areas:

<u>Class</u>	<u>Subclasses</u>
709	217, 219, 224, 225
711	112, 113, 118, 147, 148, 150, 161, 162
714	6

Additionally, a computer database search was conducted on the USPTO systems EAST and WEST.

**(D) The following is a list of the references deemed most closely related to the subject matter encompassed by the claims:**

<u>U.S. Patent Number</u>	<u>Inventors</u>
5,928,327	Wang et al
6,006,342	Beardsley et al
6,253,271	Ram et al

**(D1) References of General Interest**

5,285,528	Hart
5,504,873	Martin et al
5,548,724	Akizawa et al
5,659,718	Osman et al
5,671,377	Bleidt et al
5,710,881	Gupta et al
5,774,731	Higuchi et al
5,832,222	Dziadosz et al
6,078,990	Frazier

It should be noted that the Petition filed on February 17, 2004 listed the above noted references but did not clearly state that such references were of general interest and are not deemed by the Examiner to be most closely related to the subject matter recited in the claims. Therefore, a discussion of these

references of general interest is not provided below in the present Petition.

A copy of each of these references (as well as other references uncovered during the search) was enclosed in February 17, 2004 IDS.

**(E) It is submitted that the present invention is patentable over the references for the following reasons.**

It is submitted that the cited references, whether taken individually or in combination with each other, fail to teach or suggest the invention as claimed. In particular, the cited references, at a minimum, fail to teach or suggest as recited in the claims:

a first feature of the present invention as recited in independent claim 1 of a first processor that is connected to said storage device control section via said connection unit and also connected on a first network external to said storage device system, that converts information of a first form received over said first external network into information of a second form, and that issues a request for access to said plurality of storage devices, and a second processor that controls activation of said first processor;

a second feature of the present invention as recited in independent claim 15 of a first processor that converts information of a first form received over said first external network into information of a second form, and issues a request for access to said plurality of storage devices has the activation thereof controlled by a second processor.

Further, the cited references fail to teach or suggest the above noted features of the present invention when taken in combination with other limitations recited in the claims.

The references considered most closely related to the claimed invention are briefly discussed below:

Wang (U.S. Patent No. 5,928,327) discloses a system which includes one or more central control modules (CCM)'s, one or more delivery modules (DM)'s and one or more storage modules (SM)'s. Each CCM is a conventional computer equipped with two conventional Small Computer Serial Interface (SCSI) cards, each operating in an "initiator" mode for interfacing with one or more OM's and SM's respectively. Each CCM also has local memory used as an intermediate memory buffer to store data retrieved from a SM prior to delivery to a OM. Each CCM additionally has a communication interface for coupling to a single user (client) or a client network.

As per Wang, each CCM processes the commands received from the clients, schedules the playback of the multiple video streams, manages the video file structure and controls the flow of video data to the OM (or OM's) to ensure real-time playback. Each OM is also a conventional computer equipped with a conventional SCSI controller card operating in a "target" mode. In addition to having a SCSI controller, the OM's are each equipped with one or more processing modules for processing the video stream prior to delivery to the client. In one embodiment, the processing modules are video decoders, each dedicated to decompressing a video data stream. In this embodiment as taught by Wang the processing modules are conventional network interface cards for formatting the video stream and delivering the video stream to a client over a network such as an ethernet, Asynchronous Transfer Mode (ATM), or Public Switched Telephone Network (PSTN) network and the like. Additionally, each OM has local memory used as a video

buffer for storing video data prior to processing on the OM. Each SM is a high capacity storage medium adapted to store digital information such as video data and is accessed by the CCM module using standard SCSI protocol. Each SM, for example, is a hard disk, or CO-ROM drive or a bank of hard disks or a bank of CO-ROMS or another type of high capacity storage medium.

Further in accordance with Wang, the CCM manages the file system using a hybrid file management scheme to obtain increased performance in data access and to improve memory utilization. The hybrid file management scheme employs both the file management system that is included in the conventional operating system running on the CCM as well as customized file management software that bypasses the conventional file manager in order to directly control and access raw video data stored on the storage devices. This hybrid scheme optimizes access time with respect to video data yet utilizes the file management services of the operating system to manage the control information associated with the raw video data as well as the video storage maps. (See column 3, lines 35-67).

More particularly, Wang at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, and the above described second feature of the present invention as recited in independent claim 15, and further fail to teach or suggest these features of the present invention in combination with the other limitations recited in each of the independent claims.

Ram (U.S. Patent Number 6,253,271) discloses, in FIG. 1 thereof, a computer system having a plurality of loosely-coupled processors that

collectively provide a high-performance file server is illustrated. One or more client computers 90 are connected over a network 100 to one or more network processors (NP)'s 110 and 112. Each of NPs 110 and 112 has one or more network interlace cards (NIC)'s 112 which are connected to the network 100. In the illustrated embodiment, the NIC's 112 are connected into a peripheral component interconnect (PCI) bridge 114.

The PCI bridge 114 in turn is connected to a central processing unit (CPU) 116 which supplies processing capability for the NP 110. The CPU 116 receives data and instructions from a random access memory (RAM) 118. The RAM 118 preferably supports a read cache which buffers network request data in case the client 90 requests previously retrieved data. To increase the performance of the system, the system of FIG. 1 leverages a unified memory image capability of the system, which means that all processors can access the same memory space, to provide caches having segments which are dynamically allocatable to different NPs. The dynamic allocation process reduces the need to move or shift data around the system of FIG 1 by having a plurality of file storage processors (FSP)'s which monitor the location of cached files such that when an incoming request from one NP results in a hit in the read cache of a second NP, the responding FSP can simply request the second NP to respond. In this manner the read cache of the individual NPs is global, resulting in additional efficiencies and performance gain as disk accesses are minimized.

As per Ram, the CPU 116 is also shown connected to a second bridge 122, a PCI bridge, which in turn is connected to an interconnect bus 120, such as a scalable coherent interface (SCI), via a card 124. The SCI interconnect

bus 120 may be deployed in a number of topologies, including a ring configuration where subsystems are connected as a ring which does not support hot-pluggability. Alternatively, the SCI interconnect 120 may be a multi-ported switch where each sub-system is on its own SCI ring and therefore can be hot-plugged. Additional port switches can be used to improve the system bandwidth. The standard SCI interconnect uses five meter point-to-point cabling with two fifty-pin high density Small Computer System Interface (SCSI) style connectors. The network processors 110 and 112 provide all protocol processings between a network layer data format and an internal file server format for communicating client requests to other NPs and FSP's in the system.

In Ram, according to the illustrated embodiment, data is supplied to clients 90 from one or more file storage processors (FSP)'s 150 and 160 which are connected to the SCI interconnect bus 120, The FSP 150 connects to the SCI interconnect bus 120 using an SCI interface 130. The SCI interface 130 is connected to a buffer bridge 132 and a PCI bridge 134. The PCI bridge 134 in turn is connected to a CPU 136, which handles host processing operations as well as file processing operations. The CPU 136 is connected to a RAM 138 which supports a metadata cache as well as a write cache to increase file storage access requests. The metadata cache in the RAM 138 contains file management information, including a directory name look-up table, among others. The directory name look-up table is used to speed up directory search operations, as UFS directories are flat and must be searched sequentially. Further, the directory name look-up table maintains hits and misses for short file names. In the directory name look-up table, data



structures are kept in a least recently used (LRU) order and maintained as a hashed table. The CPU 136 is also connected to a second PCI bridge 140 which in turn is connected to one or more disk controllers 142 and 144. The disk controllers 142 and 144 in turn drive a plurality of data storage devices 146 and 148. The buffer bridge 132 is also connected to the PCI bridge 140 to provide a path that enables network processors 110 and 112 that are connected to the SCI interconnect bus 120 to directly communicate with data storage devices 146-148 via disk controllers 142 144.

As taught in Ram, a short-cut path is provided through which the client 90 can receive data from the combination of disk controllers 142-144 and data storage devices 146-148 via the buffer bridge 132. As the local CPU 136 and the RAM 138 of the file storage processor 150 are minimally involved in the disk operation, response times to data storage requests from the client 90 are reduced. Further, the contention for local FSP buses is reduced. Additionally, the CPU 136 as well as the RAM 138 of the file storage processor 150 are available for handling other tasks required of the file storage processor 150. The off-loading of tasks from the CPU 136 and the RAM 138 ultimately results in a more responsive server system. (See column 3, line 10 to column 4, line 31 and Fig. 1).

More particularly, Ram at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, and the above described second feature of the present invention as recited in independent claim 15, and further fail to teach or suggest these features of the present invention in combination with the other limitations recited in each of the independent claims.

Beardsley (U.S. Patent Number 6,513,097) discloses a storage controller 2 in Fig. 1 which interfaces between host computers or devices (not shown) and DASDs 46, 48. The DASDs may be organized in a redundant array of independent disks, i.e., a RAID array. In preferred embodiments, the storage controller 2 is divided into two clusters, cluster 0 and cluster 1. Cluster 0 consists of host adapters 4, 6, a nonvolatile storage unit (NVS) 8, a cache 10, a processor 12, a device adapter bus 14, device adapters 16, 18, 20, 22. Cluster 1 consists of host adapters 24, 26, an NVS 28, a cache 30, a processor 32, a device adapter bus 34, and device adapters 36, 38, 40, 42. A host adapter bridge 44 interfaces the components of cluster 0 with cluster 1. The host adapters 4, 6, 24, 26 are connected to the host adapter bridge 44.

In Beardsley, according to the preferred embodiments, the bridge 44 is a dual master bus which may be controlled by one of the processors 12, 32 or one of the host adapters 4, 6, 24, 26. In further embodiments, the host adapter bridge 44 may include bridge technology to allow the bus to operate at its own clock speed and provide a buffer to buffer data transferred across the bridge 44. The bridge 44 interconnects the host adapters 4, 6, 24, 26 with the processors 12, 32. In preferred embodiments the processors 12, 32 are symmetrical multi-processors. (See col. 3, lines 35-65, col. 4, lines 1-25).

More particularly, Beardsley at a minimum does not teach or suggest the above described first feature of the present invention as recited in independent claim 1, and the above described second feature of the present invention as recited in independent claim 15, and further fail to teach or suggest these features of the present invention in combination with the other limitations recited in each of the independent claims.

Therefore, since the cited references at a minimum fail to teach or the above described first feature of the present invention as recited in independent claim 1, and the above described second feature of the present invention as recited in independent claim 15, and further fail to teach or suggest these features of the present invention in combination with the other limitations recited in each of the independent claims, it is submitted that all of the claims are patentable over the cited references whether said references are taken individually or in combination with each other.

Again, it is noted that the above described references are those deemed by Applicants to be most closely related to the subject matter recited in the claims. Accordingly, a detailed discussion of such references is not provided.

**(F) Conclusion**

Applicant has conducted what it believes to be a reasonable search, but makes no representation that "better" or more relevant prior art does not exist. The United States Patent and Trademark Office is urged to conduct its own complete search of the prior art, and to thoroughly examine this application in view of the prior art cited herein and any other prior art that the United States Patent and Trademark Office may locate in its own independent search. Further, while Applicant has identified in good faith certain portions of each of the references listed herein in order to provide the requisite detailed discussion of how the claimed subject matter is patentable over the references, the United States Patent and Trademark Office should not limit its review to the identified portions but rather, is urged to review and consider the

entirety of each reference, and not to rely solely on the identified portions when examining this application.

In view of the foregoing, Applicant requests that this Petition to Make Special be granted and that the application undergo the accelerated examination procedure set forth in MPEP 708.02 VIII.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, or credit any overpayment of fees, to the deposit account of MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C., Deposit Account No. 50-1417 (TMI-5010).

Respectfully submitted,

MATTINGLY, STANGER, MALUR & BRUNDIDGE, P.C.



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